

A Workman's Recipe for Mastic Cement.—112 lb. fine-sifted freestone, dried in a frying-pan or oven; 6 lb. whitening; 8 lb. litharge: to be well mixed together, and kept dry. The walls to be perfectly free of dust or damp; then brushed over with boiled linseed oil; and the cement mixed with same when applied. Is excellent for pointing round window or door frames, as it unites wood and stone together.

"An Experimental School of Mechanical Science remains to be formed."—Tredgold.

In using a screw-driver, power will be gained by applying it at an angle with the nail; an angle of 15 degrees giving a leverage of about 1½ inch for every 6 inches in the length of the screw-driver.

Pipes of iron will bend "very kindly," and without collapsing, if they be filled, at the part to be bent, with melted lead, and bent immediately the lead has ceased to be fluid: when the wished-for curvature is obtained, the lead is easily melted out of the pipe.

Blasting Rocks.—The following method of blasting rocks with gunpowder has for a century been practised in the extensive iron-mines in Sweden. Suppose the bore to be 9 inches deep, the lower 4 inches are preserved empty by inserting a piece of pasteboard cut to the size of the hole, and with a stick underneath attached to it in the middle: to prevent the pasteboard being air-tight, four notches may be made, so as to allow the air, but not the powder, to pass through: the orifice is then loaded, stemmed, and fired in the usual way. The principle of action is the rarefaction of the 4 inches of air in the bottom of the hole, when heated by the explosion of the gunpowder, and its consequent expansive power, or force; being identical with the bursting of a gun-barrel when improperly loaded in the same way.

Stained Marble.—In the Bodleian Library are shown some specimens of marble representing landscapes and various figures. They are by many considered as freaks of nature; but, in fact, they are nothing more than pieces of stained marble. This art was exercised in the seventeenth century by a Mr. Bird, a stone-cutter in Oxford. Several were shown to Charles II. soon after the Restoration. They were broken in his presence, and found to correspond through the whole substance. Mr. Wood's words are, "William Bird, of Hallywell, in the suburbs of Oxford, did, in the latter end of this year (1657), find out the painting or staining of marble, a specimen of which he presented to the king after his restoration; as also to the queen; and, in 1669, to Cosmo, Prince of Tuscany, when in Oxford."

Water Gleanings.—Hard water, if habitually drunk, is apt to injure the digestive organs, and the glandular and absorbent system. To this are attributed the gollres to which the inhabitants of mountainous districts, who drink such water, are liable; and which consist in the preternatural enlarging of a gland in the neck. "That which runs over gravel, is always hard."—Nimrod. To determine whether water be hard or soft; that is, fit or not fit for domestic purposes:—to a glassful of the water, add a few drops of solution of soap in alcohol: if the water be pure, it will continue limpid; if it be impure, white flakes will be formed. To make salt-water fresh:—The distillation of palatable and fresh water at sea was effected by P. Nicole, of Dieppe, by simply causing the steam arising from boiling sea-water, in a still, to pass through a stratum of coarsely-powdered charcoal, in its way to the condenser, or worm-tube. To make sea-water fit for washing linens, at sea:—Soda put into sea-water renders it turbid: the lime and magnesia fall to the bottom. As much soda must be put in as not only to effect a complete precipitation of these earths, but to render the sea-water sufficiently limpid or alkaline. Soda should always be taken to sea for this purpose. To make artificial sea-water:—Take common sea-salt, 2 lbs.; bitter purging-salt, 2 oz.; magnesia earth, ½ oz.; dissolve all in river-water, 6 gallons. These, it is said,

are the exact proportions and contents of sea-water, from an accurate analysis. To make an artificial chalybeate spring:—Dr. Hare says, if we place a few pieces of silver coin, alternating with pieces of sheet-iron, in water, it will soon acquire a chalybeate taste, and a yellowish hue; and in twenty-four hours flakes of oxide of iron will appear. Hence, if we replenish with water, after each draught, a vessel in which such a pile is placed, we may have a competent substitute for a chalybeate spring.

SIGHTS AND SCENERY.

The Haymarket Theatre.—The audience here were startled into great enthusiasm on the 15th inst. when they found that the graceful actress of the heroine in *Woman's Heart* (Miss Vandlenhoff) was the author of the play. It contains much nice writing and good feeling, and only wanted "wedging up," so to speak, and knocking about a bit by a more practised hand, to have obtained high praise. The dignity of the "artist" is asserted throughout, but in asserting it, the artist loses his amiability. The scenery, Renaissance interiors and exteriors, is very good. The second scene, "Angiola's" studio, and "Isolina" sitting as a model, is exceedingly effective. Mr. Barry Sullivan plays "Angiola" with much ability, but might usefully infuse more vigour in parts.

RAILWAY JOTTINGS.

Mr. Gnoch, the superintendent of the locomotive department of the Eastern Counties works, having intimated to the engineering workmen on the line that any of them who should contribute towards the support of the men thrown out of employment by the master engineers throughout the country, would be discharged, the Eastern Counties' workmen met and resolved unanimously that "This meeting, being of opinion that they have a right to expend their wages in such manner as they think proper, do hereby pledge themselves to support the Amalgamated Society of Engineers, &c. to the fullest extent in their power, and will in the meantime cheerfully subscribe one day's wages per week." A member of the executive council of the operative engineers was present, and stated that the Crewe railway men had forwarded 50l. on the previous week towards the support of the movement, and he declaimed on the injustice of the masters "condemning and seeking to put down all associations upon the part of the men, whilst they were in the very act of forming an association amongst themselves on the most obnoxious principle."

—The London and North-Western directors, it is understood, will now recommend a dividend at the rate of 6 per cent. per annum, leaving about 50,000l. to be added to the "rest."—In the Great Western the balance of receipts over expenditure for the past half-year is said to be 313,000l. and a dividend of 2½ per cent. for that period will be declared—leaving to next account about 105,000l. In the London and South-Western the net revenue for the half-year amounts to 181,976l. out of which a dividend of 5½ per cent. per annum will be paid, leaving balance to next account, 8,548l. The increase of receipts over the corresponding period of 1850 was 69,113l. while the increase of expenses was only 10,802l.—The contracts for the completion of the railway from Weymouth to Castle Cary have been signed, and the only remaining contract (that for the piece of line between Castle Cary and Frome) was ready. The line, like that portion of it complete between Frome and Chippenham, will have only a single rail.—A railway from Edinburgh to Peebles is in contemplation. It will join the North British line at Eskbank station, and be 17½ miles in length. It is estimated not to cost more than 4,000l. a mile. Mr. Wm. Chambers, of Glenormiston, the publisher, is among its chief promoters.—An old invention has been experimented with, successfully it is said, at Worcester, namely, an apparatus for taking from, and delivering parcels to, a train at full speed, without manual assistance. The plan consists of projecting parallel bars, horizontally placed, with springs, &c. which com-

municate with the passing train, take from it the parcel attached to the upper part of the van, and also affix to it whatever may be required to be despatched onward.

CHURCH BELL-HANGING AND RINGING.

In connection with your "chapter on bell-founding," &c. I would say the hanging and ringing of church bells, on our system, belongs almost exclusively to England. The principle of it is as follows:—An ordinary peal of church bells are hung on a frame, composed of strong beams of hard wood, about sixteen or twenty inches thick perpendicularly, and about half that substance horizontally. The spaces for the bells to swing are so shaped that two bells move in one of the four directions, which equalises the swinging force of the peal on all sides of the tower.

The parts of the hanging of the bell consist of the stock or block of wood, the wheel, stay and slide, and the gudgeon or pinion (fastened one at each end of the stock), which, when the bell is mounted and hung in its place, sinks into a square, cut out of the frame, into which is fixed a brass cap, in which the gudgeons turn round, bearing the weight of the bell, wheel, stock, and stay. When the bell is with its cone downwards, it is in a swinging condition, and may be sounded by pulling the rope a foot or more, according to its size, and suddenly holding the rope fast, which, by checking the bell's swinging motion, causes the clapper to strike the side, and, on allowing the rope to slip out of the hand, the bell swings to its opposite side of the space in which it hangs, and by jerking or checking the rope downwards, it strikes again, and thus a continual sounding of the bell follows at regular intervals, which is termed chiming. But, in order to bring out the full tone of the bell, another plan of ringing is adopted, by which art is made to supply what animal strength could never accomplish, within the reach of one man, and that is, rising and afterwards ringing a peal of changes on church bells, balanced after the following plan: when a bell is raised, the ringer, prior to commencing, folds the end of the bell-rope, as many times round his right hand, in rings, as will raise his hand near to the smooth part on the rope, called the Sally, and taking the end of the rope in his left hand, he clinches the folded rope with his right hand, inside the wrapping, and then commences pulling, which puts the bell in swinging motion, and, by pulling harder each swing, and letting out two or three inches of the rope at each pull, the bell gradually rises, until the end of the rope is a little above his head, the bell raised with its opening facing the top of the belfry, and the rope quite round the wheel, through which one end of the stock passes. To avoid sending the bell over the circle it has made (that would twist the rope a second time round the groove of the wheel, and draw it through the hole in the ceiling of the ringing chamber, and lift the ringer up to it, if he held tight, providing it was a heavy bell), a piece of wood, called the stay, is fastened to the stock, rising two or three feet above it, and made to push another piece backwards and forwards, called the slide, which is placed under the bell, and fastened or supported at one end to the frame, and working backwards and forwards on the opposite end, the distance of which is regulated so as to allow the bell, when set, to lean over sufficiently to ensure a regular balance: thus, each time a bell sounds it makes a circle, prior to the clapper striking its cone inwardly, near the edge, and the sound from the blow of the clapper being carried round with the circle made by the bell, produces the fine swelling tone which a church bell (especially if a large one) sends forth, when rising and swinging, each time it strikes when up. There is something peculiarly interesting in the sight of a peal of large church bells, hung on a frame; and to persons who have no notion of the principle on which they are hung, it must appear wonderful, that a bell, weighing a ton, or thirty hundred weight, can be raised by one man, and be kept swinging round in a peal of changes sometimes lasting four hours; but this